

## ATI Allegheny Ludlum Stainless Steel Type 439/AL 439HP™, 30% cold work (ASTM XM-8; UNS S43035)

Category : Metal , Ferrous Metal , Stainless Steel , T 400 Series Stainless Steel

### Material Notes:

Allegheny Ludlum Stainless Steel Type 439, a titanium stabilized, 18 percent chromium alloy, also known as ASTM XM-8 and by the UNS designation S43035, is a ferritic stainless steel designed to resist corrosion in a variety of oxidizing environments from fresh water to boiling acids. It may be used in either the annealed, cold formed or as-welded condition. Type 439 may also be used in many oxidizing environments where Type 304 is considered adequate in term of general corrosion resistance but is subject to chloride stress corrosion cracking. The composition of Type 439 stainless steel has been balanced to provide a completely ferritic structure at all temperatures, to avoid the loss of ductility after welding and to provide resistance to intergranular corrosion. Type 439 does not require annealing after welding to restore ductility or to provide intergranular corrosion resistance. Excellent resistance to stress corrosion cracking, good weldability, high thermal conductivity and low thermal expansion characteristics make Type 439 stainless steel an ideal consideration for many applications. For shell and tube heat exchangers where carbon steel shells are used with Type 439 tubes the close match of thermal expansion coefficients may possibly eliminate the need for an expansion joint in the heat exchanger. Type 439 has a low carbon content making it an attractive consideration for nuclear applications. Type 439 also provides good oxidation and corrosion resistance for many automotive exhaust system components and residential furnace primary heat exchangers. Information provided by Allegheny Ludlum Corporation.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_ATI-Allegheny-Ludlum-Stainless-Steel-Type-439AL-439HP-30-cold-work-ASTM-XM-8-UNS-S43035.php](http://www.lookpolymers.com/polymer_ATI-Allegheny-Ludlum-Stainless-Steel-Type-439AL-439HP-30-cold-work-ASTM-XM-8-UNS-S43035.php)

Physical Properties	Metric	English	Comments
Density	7.70 g/cc	0.278 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	680 MPa	98600 psi	
Tensile Strength, Yield	635 MPa	92100 psi	
Elongation at Break	5.0 %	5.0 %	
Modulus of Elasticity	200 GPa	29000 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	10.2 μm/m-°C	5.67 μin/in-°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	11.6 μm/m-°C	6.44 μin/in-°F	
	@Temperature 20.0 - 500 °C	@Temperature 68.0 - 932 °F	

Thermal Properties	Metric	English	Comments
	@Temperature 20.0 - 800 °C	@Temperature 68.0 - 1470 °F	
	13.6 µm/m-°C	7.56 µin/in-°F	
	@Temperature 20.0 - 1000 °C	@Temperature 68.0 - 1830 °F	
Specific Heat Capacity	0.460 J/g-°C	0.110 BTU/lb-°F	
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
Thermal Conductivity	24.2 W/m-K	168 BTU-in/hr-ft <sup>2</sup> -°F	
	24.2 W/m-K	168 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.012 %	0.012 %	
Chromium, Cr	17 - 19 %	17 - 19 %	
Iron, Fe	81 %	81 %	as balance
Manganese, Mn	0.45 %	0.45 %	
Nickel, Ni	0.23 %	0.23 %	
Nitrogen, N	0.013 %	0.013 %	
Phosphorous, P	0.020 %	0.020 %	
Silicon, Si	0.55 %	0.55 %	
Sulfur, S	<= 0.0010 %	<= 0.0010 %	
Titanium, Ti	0.40 %	0.40 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000630 ohm-cm	0.0000630 ohm-cm	

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